THE CLAIMS

What is claimed is:

1. An electrical heating assembly adapted to receive at least one food container which has a plurality of food retaining surfaces that demarcate a maximum volume of food that can be retained in the container, wherein the heating assembly comprises at least a first heating tray part and a second heating tray part; with both the first and second heating tray parts being arranged to define, after closing, a closed heating housing around the at least one food container; the housing comprising heating surfaces with associated resistive elements and having an internal cavity that is configured and dimensioned to receive the at least one food container and to substantially match the shape of one or a plurality of the food retaining surfaces of the food container upon closing of the heating device so that one or more of the heating surfaces of the housing substantially contact the food retaining surfaces of the food container for direct conduction of heat from the heating surfaces to the food retaining surfaces to heat food in the container.

2. The heating assembly of claim 1, wherein the housing comprises internal resistive heating surfaces that are configured and dimensioned in number and shape to substantially contact all food retaining surfaces of the containers.

3. The heating assembly of claim 1, wherein the heating surfaces of the housing are in the form of supporting non-moveable heating layers that are sized and shaped to receive a defined configuration and shape of food container.

4. The heating assembly of claim 3, wherein the heating layers comprises resistive heating elements and a solid matrix forming the heating surface.

5. The heating assembly of claim 4, wherein the heating surfaces have zones of relatively lower power density and zones of relatively higher power density.

6. The heating assembly of claim 5, wherein the food container includes bottom and side surfaces and the heating surfaces contacting the container include bottom and side surfaces, wherein the side heating surfaces apply a resistive power density to the side surfaces

of the food container that is between 2 to 6 times lower than that applied by the bottom heating surface to the bottom surface of the food container.

7. The heating assembly of claim 6, wherein the heating surfaces include a top surface adapted to heat food in the food container by convection, radiation and/or conduction heating.

8. The heating assembly of claim 5, wherein the housing includes edges or corners that either have no heating elements or form insulated zones for contacting the container.

9. The heating assembly of claim 4, wherein the heating resistive elements are capable of providing an average electrical resistive power density of the heating surfaces of at least 0.45 Watts per square centimeter in at full power but with no localized area of the surface providing more than 1.2 Watts per square centimeter.

10. The heating assembly of claim 4, which further comprises means for measuring temperature at the heating surfaces; and a controlling assembly for receiving an input from the temperature measuring means wherein the controlling assembly controls the temperature of the heating surface when the input reaches a predetermined temperature set point by varying the voltage or time proportioning the electrical current or controlling the amplitude of the alternating current which is sent to the resistive heating elements.

11. The heating assembly of claim 9, wherein the amount of power provided to the food container is controlled from a higher power mode to a reduced power mode as the food product heats up to a predetermined serving temperature.

12. The heating assembly of claim 11, wherein the controlling assembly controls the temperature of the heating surfaces by profile control whereby the temperature of the heating surfaces sensed by temperature measuring device is compared at one or more regular time intervals to a preset temperature profile stored in a control memory of the controlling assembly.

13. The heating assembly of claim 11, wherein the amount of power is controlled from an average power density in a high power mode of from 0.40 to 0.80 Watts per square

centimeter to a reduced power density of less than 0.18 Watts per square centimeter in a reduced power mode.

14. The heating assembly of claim 4 , wherein the resistive heating elements comprise wire(s), mat(s), woven or unwoven fabric(s), grid(s), etched foil(s) or tubular heater(s).

15. The heating assembly of claim 1, wherein the heating layers have a solid matrix of a bent, molded or shaped material.

16. The heating assembly of claim 15, wherein the material is a thermoconductive metallic material selected among the group consisting of aluminum, steel, stainless steel, copper, nickel-chromium, nickel-iron-chromium or other heat resistant thermoconductive alloys.

17. The heating assembly of claim 1, wherein the first tray part is a recipient heating tray part which forms a first concave shaped resistive heating surface for receiving the food container in a substantially fixed position within the heating device and the second tray part is a closing plate-shaped member having a resistive heating surface adapted to move relative to the recipient tray part from an opening position wherein the heating device is in an open configuration and a heating position wherein the housing is securely closed.

18. The heating assembly of claim 1, wherein the food container and the tray parts have complementary discrete portions of relief adapted to position the food container only in a limited number of positions within the housing.

19. The heating assembly of claim 18, wherein the number of positions the food container complementary fits the housing is between 2 and 4 inclusive.

20. The heating assembly of claim 17, wherein the first and second heating tray parts comprise a thermally and electrically insulating jacket peripherally adjacent the heating layers of the internal resistive heating surfaces of the housing.

21. The heating assembly of claim 17, wherein the heating layers are made removable so as to be replaced by heating layers sized and shaped to conform to containers of other shapes or dimensions.

22. A portable heating device comprising the heating assembly of claim 1.

23. A method for rapidly heating a food within a container which comprises:

providing a food container having a plurality of food retaining surfaces in a configuration that demarcates a maximum volume of food that can be retained in the container;

providing an electrical heating device comprising a closed heating housing with the housing comprising resistive heating elements and internal heating surfaces and being configured with an internal cavity that substantially conforms to the configuration of one or more of the food container surfaces;

positioning the food container in the housing so that upon, closing of the heating device, the internal heating surfaces of the housing substantially contact one or more food retaining surfaces for direct heat conduction from the internal heating surfaces; and

applying electrical current to the heat resistive elements to transfer heat to heat food in the container.

24. The method of claim 23, wherein the housing comprises internal heating surfaces that substantially contact all the surfaces of the containers.

25. The method of claim 23, wherein the heating of the heating surfaces is controlled by profile control wherein the temperature of the heating surfaces sensed by sensors is compared at regular time interval to a preset temperature profile stored in a control memory and the power delivered to the heating surfaces is proportional to the differential between the set point and the sensor signal.

26. A method for vending food products in food outlets, the method comprising:

providing a heating cavity having thermal conductive heating surfaces ;

placing a container including the food product into the heating cavity, wherein the container engages at least first and second surfaces of the thermal conductive heating surfaces;

resistively energizing the heating surfaces for heating the food product through conduction of thermal energy to transfer such energy to the food container surfaces to produce a heated food product; and

opening the heating cavity and serving the heated food product from the opened cavity.

27. The method of claim 26 in which the heated food product is capable of being held in the heating cavity to keep it warm by controlling the reduction of the power of the heating surfaces.

28. The method of claim 26, wherein heating of the heating surfaces is controlled by profile control wherein the temperature of the heating surfaces sensed by sensors is compared at regular time intervals to a preset temperature profile stored in a control memory and the power delivered to the heating surfaces is proportional to the differential between the set point and the sensor signal.

29. A heating combination for rapidly heating food which comprises:

a food container having a plurality of food retaining surfaces in a configuration that demarcates a maximum volume of food that can be retained in the container; and

an electrical heating device comprising at least a first heating tray part and a second heating tray part; both first and second heating tray parts being arranged to define, upon closing, a closed heating housing around the food container, with the housing comprising internal resistive heating surfaces arranged to receive and substantially match the configuration of the food container so that the food container is substantially in contact with internal resistive heating surfaces of the housing for direct conduction of heat to the food container for heating of food therein.